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| Applicant: | Xinnian Dong et al. | Art Unit: | 1649 |
| Serial No.: | 08/908,884 | Examiner: | A. Nelson |
| Filed: | August 8, 1997 | | |
| Title: | ACQUIRED RESISTANCE GENES AND USES THEREOF | | |

BOX APPEAL
Commissioner For Patents
Washington, DC 20231

APPELLANTS' BRIEF ON APPEAL
SUBMITTED PURSUANT TO 37 CFR § 1.192

In support of appellants' notice of appeal filed January 26, 2000 of the Examiner's final rejection mailed July 26, 1999, submitted herewith in triplicate is appellants' brief on appeal.

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## Real Party in Interest

The real parties in interest in this case are the above-captioned appellants, as well as appellants' assignees, the General Hospital Corporation and Duke University.

## Related Appeals and Interferences

There are no currently pending appeals or interferences related to this case.

## Status of Claims

Claims 1, 2, 4-13, 15-29, 36, and 40-42 are currently pending.

Claims 3, 14, 30-39, and 43-46 have been canceled.

Claims 1-2, 4-13, 15-29, 36, and 40-42 were finally rejected in a final Office Action mailed on July 26, 1999 and are appealed.

## Status of Amendments

All prior amendments in this case have been entered. Appellants point out that a Supplemental Amendment is filed herewith, to limit the issues on appeal. Appellants request entry of this amendment and consideration of the appeal based on the claims in Appendix B.

## Summary of the Invention

In general, appellants' invention features a novel gene family, the members of which encode regulators that control the onset of acquired resistance responses in plants. This invention is based on appellants' discovery of a gene encoding a novel disease resistance protein characterized by the presence of ankyrin repeats, as well as their finding that the transformation of the cloned gene into plants conferred broad-spectrum disease resistance. Importantly, the invention provides for the genetic engineering of long-lasting, broad-spectrum resistance in crops.

## Issues

Three issues are raised on appeal.

The first issue is whether the Examiner erred in rejecting claims 1, 2, 4-13, 15-29, 36, and 40-42 based on the written description requirement of 35 U.S.C. § 112, first paragraph.

The second issue is whether the Examiner erred in limiting the scope of appellants' claims to DNA molecules that encode the polypeptide of SEQ ID NO:14, thereby rejecting claims 1, 2, 4-13, 15-29, 36, and 40-42 as lacking enablement under 35 U.S.C. § 112, first paragraph.

And the third issue is whether the Examiner erred in finding indefinite, under 35 U.S.C. §112, second paragraph, the claim limitation "specifically hybridizes to" as recited

in claims 10-12.

## Grouping of Claims

For each of the § 112, first paragraph rejections, the claims stand or fall together.

For the § 112, second paragraph rejection, claims 10-12 stand or fall together.

## Arguments

As is clear from the Issues section above, one or more of the pending claims stand rejected on the grounds of written description, enablement, and indefiniteness. Each of these rejections, as applied in the final Office Action and Advisory Action, and appellants' response to these rejections is now presented.

### (I) Written Description

Claims 1, 2, 4-13, 15-29, 36, and 40-42 stand rejected, under 35 U.S.C. § 112, first paragraph, on the basis that the specification provides only a sequence for the *Arabidopsis NPR1* gene and therefore does not provide an adequate written description of the invention, as currently claimed. As support for this rejection, the case *Univ. Of California v. Eli Lilly and Co.*, 43 U.S.P.Q.2d 1387 (Fed. Cir. 1997) has been cited.

The adequate written description requirement of 35 U.S.C. § 112, ¶ 1 provides that

> the specification shall contain a written description of the

> invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same...

The written description requirement serves "to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him; how the specification accomplishes this is not material." *In re Wertheim*, 541 F.2d 257, 262, 191 U.S.P.Q. 90, 96 (C.C.P.A. 1976). In order to meet the written description requirement, the appellant need not utilize any particular form of disclosure to describe the subject matter claimed, but "the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1989) (citation omitted). Stated another way, "the applicant must . . . convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention." *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 U.S.P.Q.2d 1111, 1117 (Fed. Cir. 1991).

The claims in question are generally directed to products and methods that include the inventors' novel gene family encoding ankyrin-repeat-containing polypeptides that, when expressed in a plant, confer disease resistance. Independent claim 1, for example, reads:

> 1. An isolated nucleic acid molecule encoding an acquired resistance polypeptide comprising an ankyrin repeat,

wherein said acquired resistance polypeptide confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

And independent claims 10, 11, and 12 read:

> 10. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the genomic nucleic acid sequence of Fig. 4 (SEQ ID NO:1), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.
>
> 11. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the cDNA of Fig. 5 (SEQ ID NO:2), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.
>
> 12. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the DNA sequence of Fig. 7A (SEQ ID NO:13), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

Appellants' specification clearly describes to the skilled worker what is claimed. The specification, for example, at page 43 (line 27) - page 44 (line 13), teaches the ankyrin repeat consensus that characterizes the polypeptides encoded by the claimed gene family. And Figures 6A and 6B depict the region identified by appellants as the ankyrin-repeat consensus. Clearly, based on this description, one skilled in the art would

recognize that appellants' invention encompassed — not one gene — but a family of genes encoding ankyrin-repeat-containing, disease resistance polypeptides.

In addition, appellants point out that this ankyrin repeat is a prominent feature of the claimed disease resistance polypeptides. Contrary to the assertion made in the final Office Action that the ankyrin motif includes merely a small region of the disclosed molecule, appellants note that, in fact, the repeat consensus spans over at least 20% of the encoded gene product, from about amino acid 265 to about amino acid 393. The ankyrin motif is therefore not an insignificant feature of the disease-resistance-conferring proteins. Rather, as is discussed above, the ankyrin consensus sequence provides a diagnostic feature that is readily recognizable to the skilled worker.

Moreover, and again contrary to the assertions in the final Office Action, appellants' ankyrin repeat-containing protein family does indeed exist and its members can indeed be distinguished from unrelated genes containing this motif. As established by appellants, the ankyrin-repeat-containing proteins of the present invention confer, on a plant expressing such a protein, disease resistance. As a result of this feature, the polypeptide is readily distinguishable from unrelated ankyrin-repeat-containing polypeptides that have been described in the literature, which, to the best of appellants' knowledge, have not been shown to possess this property. Moreover, because acquired resistance plant defense responses are ubiquitous in the plant kingdom, and because appellants have demonstrated that an ankyrin-repeat-containing polypeptide controls the

onset of such responses in *Arabidopsis*, it is entirely reasonable to assume that other plants possess and express such genes to regulate disease resistance. The Office's concerns that appellants' claimed family of nucleic acid molecules does not exist or that its members could not be identified are therefore unwarranted.

Finally, appellants submit that their specification provides a written description of the presently claimed invention in sufficient detail to satisfy the standard set by the Federal Circuit in the case *University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398. In particular, this case specifically states that the written description of a genus of DNA may be achieved by a "recitation of structural features common to members of the genus." *Lilly,* 43 USPQ2d 1398, 1406.

Appellants point out that, contrary to the assertion in the present Office Action, the description of the claimed invention in appellants' specification does not rely simply on the disclosed sequence of the *Arabidopsis* NPR1 gene. Rather, the present specification describes a novel class of plant disease resistance genes on the basis of a specific structural feature — an ankyrin repeat motif — common to the members of this family. Appellants' specification therefore provides a description of the class of DNA molecules encompassed by the present claims in a form entirely consistent with the standard set out in *Lilly*.

In sum, there can be no question that appellants were in possession of the claimed genus at the time their application was filed, and that one skilled in the art would

recognize appellants' disclosure as a description of the invention defined by the present claims. As a result, appellants' specification clearly satisfies the written description requirement, as set forth by the case law, and appellants request reconsideration and withdrawal of this rejection.

(II) Enablement

Claims 1, 2, 4-13, 15-29, 36, and 40-42 stand rejected, under 35 U.S.C. § 112, first paragraph, on the basis that the teaching of appellants' specification is not commensurate in scope with the present claims. The rejection essentially turns on the assertion that it would require undue trial and error experimentation to identify genes which are structurally and functionally related to the disclosed isolated nucleic acid molecule that encodes the polypeptide of SEQ ID NO: 14.

Appellants submit that, contrary to this assertion, the specification clearly enables the subject matter presently claimed simply by providing appellants' newly identified *NPR1* sequence. In particular, given the teaching of the specification and the level of skill known in the art at the time the present application was filed, genes falling within the scope of appellants' claims could routinely be identified and isolated from a variety of plant sources using nothing more than standard techniques of molecular biology.

With respect to gene isolation methodologies, clear instructions for isolating other claimed nucleic acid molecules are provided in the specification, under the heading

"Isolation of Solanaceous AR Genes," at pages 49-50, and also under the heading "Isolation of Other Acquired Resistance Genes," at pages 50-52. There, appellants set forth general guidance on the routine methods known at the time the application was filed for identifying the gene sequences required by the claims. These standard cloning methods described in the specification include: (1) the design and utilization of oligonucleotides for cloning acquired resistance gene sequences, (2) low- and high-stringency hybridization cloning methodologies, (3) library screening procedures, and (4) PCR-based amplification cloning strategies. Using such techniques, genes falling within the claims may be readily isolated from virtually any plant using appellants' *NPR1* sequence as a starting material.

In addition, once isolated, these gene sequences may be subjected to standard DNA sequencing to confirm their structural relatedness to the disclosed *NPR1* gene and its encoded ankyrin-repeat-containing polypeptide. If desired, publicly available sequence analysis software may be utilized for rapidly identifying the ankyrin-repeats. It cannot be disputed that all of the above methods are routinely used in the art of molecular biology and that all were well established at the time appellants filed their application.

In addition, as further evidence that genes encoding appellants' ankyrin repeat-containing, disease resistance polypeptides may be isolated using nothing more than standard techniques, the Examiner is directed to the present specification, for example, at pages 49-50. There, appellants demonstrate the successful and straightforward isolation

of an *NPR1* homolog from tobacco. This homolog was identified by screening a cDNA library with probe prepared from the full-length *Arabidopsis NPR1* cDNA. The isolated solanaceous acquired resistance gene, like the cruciferous *NPR1* gene, was found to encode an ankyrin-containing polypeptide. In addition, the tobacco NPR1 homolog shows significant sequence identity to the *Arabidopsis* NPR1 gene product. Consistent with these results in tobacco are the results described in the present specification at page 52 (lines 4-15). There, results of an RNA blot experiment are described that demonstrate the existence of yet another *NPR1*-hybridizing RNA, in this case, in potato.

Such data strongly corroborate appellants' assertion that structurally related gene sequences falling within appellants' claimed invention exist, and that they may be identified and isolated from a variety of plant sources using appellants' *NPR1* sequence and standard techniques that are both described in the present specification and known in the art. There can be no question that the guidelines provided by the teachings of appellants' disclosure have been effective for such gene identification from at least two plants other than *Arabidopsis*, and there is no reason to believe that *NPR1* homologs cannot similarly be identified from any number of other sources.

With respect to the further issue of whether such genes would confer disease resistance, appellants again refer to the present specification. As taught, for example, at page 69 (lines 15-17), the ability of a structurally related gene to confer plant disease resistance is easily established using any of a variety of methods, including a

straightforward, one-step screening technique. The specification makes clear that broad-spectrum pathogen resistance is readily obtained by expressing acquired resistance transgenes at sufficiently high levels to initiate a plant defense response. Moreover, at pages 45-46, the specification demonstrates that overexpression of a *35S-NPR1* transgene in *Arabidopsis* conferred resistance on the plant to bacterial and fungal pathogens. Accordingly, a skilled worker need only prepare transgenic plants overexpressing a gene found to be structurally related to *NPR1*, and then evaluate the plant's ability to combat a pathogen. Such a single-step screening approach cannot and does not constitute undue trial and error experimentation.

In conclusion, appellants submit that the specification adequately describes the methods to be used to practice the invention, commensurate with the scope of the pending claims. Appellants know of no information a practitioner would require to carry out the invention that is not spelled out in detail in the application, or that was not known in the art when the application was filed. Accordingly, appellants respectfully request reconsideration on this issue and withdrawal of the enablement rejection under § 112, first paragraph.

(III) Indefiniteness

Claims 10-12 also stand rejected, under 35 U.S.C. § 112, second paragraph, as indefinite in view of two claim terms: "that confers" and "specifically hybridizes to."

With respect to the first term, "that confers," appellants refer to the Supplemental Amendment filed herewith. It is the Examiner's contention that it is unclear whether this term defines the polypeptide encoded by the isolated nucleic acid molecule or merely the ankyrin repeat motif. Appellants have amended claims 10-12 to specify that it is the polypeptide that confers resistance to plant pathogens, and, upon entry of this Amendment, this rejection may be removed from the issues on appeal.

Turning to the second claim term at issue, "specifically hybridizes to," appellants take the position that this term is definite. Appellants first point out that this term is defined in the specification at page 12 (lines 1-3). There, the specification states:

> By "specifically hybridizes" is meant that a nucleic acid sequence is capable of hybridizing to a DNA sequence under at least low stringency conditions as described herein, and preferably under high stringency conditions, also as described herein.

The specification goes on, at pages 51 (line 12) - 52 (line 3), to describe exemplary low and high stringency hybridization conditions. For example, with respect to exemplary high stringency conditions, the specification, at page 51 (lines 12-21) states:

> In one particular example of this approach, related AR sequences having greater than 80% identity are detected or isolated using high stringency conditions. High stringency conditions may include hybridization at about 42°C and about 50% formamide, 0.1 mg/mL sheared salmon sperm DNA, 1% SDS, 2X SSC, 10% Dextran sulfate, a first wash at about 65°C, about 2X SSC, and 1% SDS, followed by a second wash at about 65°C and about 0.1X SSC. Alternatively, high stringency conditions may include hybridization at about

> 42°C and about 50% formamide, 0.1 mg/mL sheared salmon sperm DNA, 0.5% SDS, 5X SSPE, 1X Denhardt's, followed by two washes at room temperature and 2X SSC, 0.1% SDS, and two washes at between 55-60°C and 0.2X SSC, 0.1% SDS.

And, with respect to low stringency conditions, the specification, at pages 51 (line 22) - 52 (line 2), states:

> In another approach, low stringency hybridization conditions for detecting AR genes having about 40% or greater sequence identity to the AR genes described herein include, for example, hybridization at about 42°C and 0.1 mg/mL sheared salmon sperm DNA, 1% SDS, 2X SSC, and 10% Dextran sulfate (in the absence of formamide), and a wash at about 37°C and 6X SSC, about 1% SDS. Alternatively, the low stringency hybridization may be carried out at about 42°C and 40% formamide, 0.1 mg/mL sheared salmon sperm DNA, 0.5% SDS, 5X SSPE, 1X Denhardt's, followed by two washes at room temperature and 2X SSC, 0.1% SDS and two washes at room temperature and 0.5X SSC, 0.1% SDS.

Moreover, appellants' specification, at page 49 (lines 14-20), describes the following additional low stringency hybridization conditions:

> Hybridization was performed at 37°C in 40% formamide, 5X SSC, 5X Denhardt, 1% SDS, and 10% dextran sulfate. The filters were washed in 2X SSC for fifteen minutes at room temperature and 2X SSC, 1% SDS for thirty minutes at 37°C.

In view of this extensive description of exemplary high and low stringency hybridization conditions, it is appellants' position that one skilled in the art would be "reasonably apprised" of the scope of the claimed invention. Various hybridization conditions can be employed to arrive at the same level of stringency, as indicated by appellants'

specification, and it is well known by molecular biologists what those conditions are. Appellants believe that a recitation of one particular format for high or low stringency hybridization conditions would unfairly limit appellants' claims and is more than is required by the case law. See, for example, *Miles Laboratories v. Shandon, Inc.*, 997 F.2d 870, 875, 27 U.S.P.Q.2d 1123, 1126 (Fed. Cir. 1993) ("If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more. . . The degree of precision necessary for adequate claims is a function of the nature of the subject matter."). Reconsideration on this issue is respectfully requested.

## Conclusion

Appellants respectfully request that the rejection of claims 1, 2, 4-13, 15-29, 36, and 40-42 be reversed. A check for $300.00 for the required appeal fee. If there are any additional charges, or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

Date: 19 July 2000

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Appendix A (Claims on Appeal)

1. An isolated nucleic acid molecule encoding an acquired resistance polypeptide comprising an ankyrin repeat, wherein said acquired resistance polypeptide confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

2. The isolated nucleic acid molecule of claim 1, wherein said polypeptide activates the expression of a pathogenesis-related polypeptide.

4. The isolated nucleic acid molecule of claim 1, wherein said isolated nucleic acid molecule is derived from an angiosperm.

5. The isolated nucleic acid molecule of claim 4, wherein said angiosperm is a member of the *Solanaceae*.

6. The isolated nucleic acid molecule of claim 4, wherein said angiosperm is a member of the *Cruciferae*.

7. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is genomic DNA.

8. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is cDNA.

9. The isolated nucleic acid molecule of claim 1, wherein said plant pathogen is a bacterium, virus, viroid, fungus, nematode, or insect.

10. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the genomic nucleic acid sequence of Fig. 4 (SEQ ID NO:1), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

11. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the cDNA of Fig. 5 (SEQ ID NO:2), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

12. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the DNA sequence of Fig. 7A (SEQ ID NO:13), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat that confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

13. The isolated nucleic acid molecule of any one of claims 10-12, wherein said nucleic acid molecule encodes a polypeptide that activates the expression of a pathogenesis-related polypeptide.

15. The isolated nucleic acid molecule of any one of claims 1 or 10-12, wherein said nucleic acid molecule is operably linked to an expression control region.

16. A vector comprising the nucleic acid molecule of any one of claims 1 or 10-12, said vector directing expression of the polypeptide encoded by said nucleic acid

molecule.

17. A transgenic cell comprising the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16.

18. The transgenic cell of claim 17, wherein said transgenic cell is a plant cell.

19. The transgenic cell of claim 17, wherein said transgenic cell is a bacterial cell.

20. The transgenic cell of claim 19, wherein said transgenic bacterial cell is *Agrobacterium*.

21. The transgenic cell of claim 18, wherein said transgenic plant cell has increased resistance to a plant pathogen.

22. A transgenic plant comprising the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16, wherein said nucleic acid molecule or said vector is expressed in said transgenic plant.

23. The transgenic plant of claim 22, wherein said transgenic plant is a transgenic angiosperm.

24. The transgenic plant of claim 23, wherein said transgenic angiosperm is a dicot.

25. The transgenic plant of claim 24, wherein said dicot is a cruciferous plant.

26. The transgenic plant of claim 24, wherein said dicot is a solanaceous plant.

27. The transgenic plant of claim 23, wherein said transgenic angiosperm is a monocot.

28. A seed from the transgenic plant of claim 22.

29. A cell from the transgenic plant of claim 22.

36. A method of producing an acquired resistance polypeptide, said method comprising the steps of:

(a) providing a cell transformed with the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16;

(b) culturing the transformed cell to express the nucleic acid molecule or the vector; and

(c) recovering the acquired resistance polypeptide.

40. A method of providing an increased level of resistance against a disease caused by a plant pathogen in a transgenic plant, said method comprising the steps of:

(a) producing a transgenic plant cell comprising the nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16; and

(b) regenerating a transgenic plant from the plant cell wherein the nucleic acid molecule or the vector is expressed in the transgenic plant and the transgenic plant is thereby provided with an increased level of resistance against a disease caused by a plant pathogen.

41. The method of claim 40, wherein said plant pathogen is a bacterium, virus, viroid, fungus, nematode, or insect.

42. The method of claim 40, wherein said plant pathogen is *Phytophthora*, *Peronospora*, or *Pseudomonas.*

Appendix B (Claims on Appeal as Amended)

1. An isolated nucleic acid molecule encoding an acquired resistance polypeptide comprising an ankyrin repeat, wherein said acquired resistance polypeptide confers, on a plant expressing said polypeptide, resistance to a plant pathogen.

2. The isolated nucleic acid molecule of claim 1, wherein said polypeptide activates the expression of a pathogenesis-related polypeptide.

4. The isolated nucleic acid molecule of claim 1, wherein said isolated nucleic acid molecule is derived from an angiosperm.

5. The isolated nucleic acid molecule of claim 4, wherein said angiosperm is a member of the *Solanaceae*.

6. The isolated nucleic acid molecule of claim 4, wherein said angiosperm is a member of the *Cruciferae*.

7. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is genomic DNA.

8. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is cDNA.

9. The isolated nucleic acid molecule of claim 1, wherein said plant pathogen is a bacterium, virus, viroid, fungus, nematode, or insect.

10. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the genomic nucleic acid sequence of Fig. 4 (SEQ ID NO:1), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat, said acquired resistance polypeptide conferring, on a plant expressing said polypeptide, resistance to a plant pathogen.

11. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the cDNA of Fig. 5 (SEQ ID NO:2), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat, said acquired resistance polypeptide conferring, on a plant expressing said polypeptide, resistance to a plant pathogen.

12. An isolated nucleic acid molecule that specifically hybridizes to a nucleic acid molecule comprising the DNA sequence of Fig. 7A (SEQ ID NO:13), wherein said isolated nucleic acid molecule encodes an acquired resistance polypeptide comprising an ankyrin repeat, said acquired resistance polypeptide conferring, on a plant expressing said polypeptide, resistance to a plant pathogen.

13. The isolated nucleic acid molecule of any one of claims 10-12, wherein said nucleic acid molecule encodes a polypeptide that activates the expression of a pathogenesis-related polypeptide.

15. The isolated nucleic acid molecule of any one of claims 1 or 10-12, wherein said nucleic acid molecule is operably linked to an expression control region.

16. A vector comprising the nucleic acid molecule of any one of claims 1 or 10-

12, said vector directing expression of the polypeptide encoded by said nucleic acid molecule.

17. A transgenic cell comprising the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16.

18. The transgenic cell of claim 17, wherein said transgenic cell is a plant cell.

19. The transgenic cell of claim 17, wherein said transgenic cell is a bacterial cell.

20. The transgenic cell of claim 19, wherein said transgenic bacterial cell is *Agrobacterium*.

21. The transgenic cell of claim 18, wherein said transgenic plant cell has increased resistance to a plant pathogen.

22. A transgenic plant comprising the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16, wherein said nucleic acid molecule or said vector is expressed in said transgenic plant.

23. The transgenic plant of claim 22, wherein said transgenic plant is a transgenic angiosperm.

24. The transgenic plant of claim 23, wherein said transgenic angiosperm is a dicot.

25. The transgenic plant of claim 24, wherein said dicot is a cruciferous plant.

26. The transgenic plant of claim 24, wherein said dicot is a solanaceous plant.

27. The transgenic plant of claim 23, wherein said transgenic angiosperm is a monocot.

28. A seed from the transgenic plant of claim 22.

29. A cell from the transgenic plant of claim 22.

36. A method of producing an acquired resistance polypeptide, said method comprising the steps of:

(a) providing a cell transformed with the isolated nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16;

(b) culturing the transformed cell to express the nucleic acid molecule or the vector; and

(c) recovering the acquired resistance polypeptide.

40. A method of providing an increased level of resistance against a disease caused by a plant pathogen in a transgenic plant, said method comprising the steps of:

(a) producing a transgenic plant cell comprising the nucleic acid molecule of any one of claims 1 or 10-12 or the vector of claim 16; and

(b) regenerating a transgenic plant from the plant cell wherein the nucleic acid molecule or the vector is expressed in the transgenic plant and the transgenic plant is thereby provided with an increased level of resistance against a disease caused by a plant

pathogen.

41. The method of claim 40, wherein said plant pathogen is a bacterium, virus, viroid, fungus, nematode, or insect.

42. The method of claim 40, wherein said plant pathogen is *Phytophthora*, *Peronospora*, or *Pseudomonas*.